Weybridge, Vermont: A Path Towards No Food Wasted

Middlebury College Environmental Studies Senior Seminar
Community Partner - Weybridge Energy Committee
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Table of Contents

I. Introduction and Background……………………………..……………..3

Abstract
Background
Key Players

II. Survey Results……………………………………………………….……..8

III. Case Studies……………………..…………………………………..10

Hamilton and Wenham Massachusetts Curbside Composting
CVSWMD Organics Management
Ferrisburgh Central – "The Gold Standard"
Island Design Assembly - Compost Commons for North Haven Community School

IV. Cost-Benefit Analysis of Food Waste Disposal Options……………......15

V. Campaign Plan……………………………………………………….17

VI. Conclusion…………………………………………………..……….22

VII. References……………..……………………………………........23

VIII. Appendix…………………………………………………..….…...24

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I. Introduction and Background

Abstract

Weybridge, Vermont, is a small, environmentally conscious town in Central Vermont with approximately 800 residents. In 2012 the Vermont State Legislature passed the Universal Recycling Law, which bans food waste from landfills by 2020. For this project we, a group of four Middlebury College Environmental Studies seniors worked with their community partner, the Weybridge Energy Committee (WEC), to help the town reach this 2020 goal. The final deliverable of the project is a compost campaign plan to be implemented by the WEC to support the transition to zero food waste. To create the campaign plan we distributed a questionnaire, interviewed community members, examined case studies to learn about other towns' success and considered the costs and benefits of the various options. We found that Weybridge is on the right track—the majority of community members have a composting routine and are interested in engaging all members of the community in composting practices. Additionally, by looking at case studies we found that pilot programs supported by grants, community involvement, a range of options as well as compost education and outreach are important strategies to reach the 2020 goal. After comparing the cost and benefit of available composting options, we found backyard composting cheaper and easier to implement than curbside composting programs, particularly for a town like Weybridge. We conclude that the best strategies to get Weybridge to zero food waste by 2020 are accessible and revolve around community-driven education, the engagement of the elementary school in a specific compost routine and the work of community members to create a couple of compost options. Because Act 148 is a soft law that lacks enforcement, we see education and outreach, and incorporating a compost system in the elementary school as the two essential steps to lead the community towards a future of zero food waste.

Background

In 2012, the Vermont Legislature unanimously passed the Universal Recycling Law (Act 148), which prohibits the disposal of the three major types of waste materials in the state: "blue bin" recyclables (by July 2015); Leaf and yard debris, clean wood (by July 2016); and food scraps (by July 2020). The first two categories are already under effect and compliance with Act 148, shifting the focus towards the food scraps diversion goal for 2020. This is significant because food scraps make up almost one third of the total waste that a typical Vermont family produces. This waste uses space and resources to manage its disposal and its decomposition produces methane, a greenhouse gas with a much stronger heat retention capacity than carbon dioxide. Act 148 is a soft law, thus is not enforced. Although the state has worked on measures to ease the transition - such as requiring that licensed haulers provide collection services for the three waste categories by 2015, 2016 and 2017 respectively - it is within smaller jurisdictions' responsibility and planning to comply with the law.

It is in this context, that the Town of Weybridge, through its Energy Committee (WEC), is developing an approach to meeting the 2020 deadline of Act 148. This small town of about 300 households and nearly 800 residents has earned statewide recognition for its leadership and environmental consciousness by winning the Home Energy Challenge organized by Efficiency Vermont. The residents of Weybridge, and especially the members of its energy committee, recognize the benefits of diverting food scraps from landfills - potentially reducing trash disposal costs, creating energy and nutrient-rich soils, conserving water and landfill space, and reducing landfill methane emissions - but beyond Act 148, the motivation lies in the belief that, in WEC chair Fran Putnam's words, "it is the right thing to do" (F. Putnam and B. Balk, personal correspondence, September 19, 2017).

Environmental Impact of Food Waste in Landfills

Adding any type of waste to landfills has a direct environmental impact because of the resources they take up such as space, water and fossil fuels used by waste processing machinery. Adding food scraps, however, has additional negative effects on the environment. When biodegradable materials, such as food scraps and organic matter, are deposited in a landfill, they decompose anaerobically and emit greenhouse gases such as methane and nitrous oxide, both of which contribute more intensely to global warming than carbon dioxide. Although certain processes aim to take advantage of these gases to produce energy, the capture rates are very low. Organic matter also contains high concentrations of water, making it heavier and thus more energy consuming. By diverting food scraps from landfills and incorporating them into biological cycles, we can improve our soil's water retention capacity. By using methods such as composting, we can return valuable soil nutrients and create natural fertilizer, reducing the use of synthetic fertilizers and their environmental impact: energy consumption, soil depletion, and water contamination.

Key Players

Weybridge Energy Committee (WEC)

The Weybridge Energy Committee (WEC) is composed of inspired community members and is an active member of the Vermont Energy and Climate Action Network (VECAN). Its self-stated mission is "to provide Weybridge residents with access to energy conservation programs and information, incentives, and support in order to promote energy efficiency and alternative energy" (Weybridge Energy Committee, New England Grassroots Environment Fund Website**)**. Through its energy programs, the committee aims to provide opportunities for residents to save money, reduce fossil fuel dependency, and ultimately lower carbon emissions that contribute to global climate change. In 2013, WEC led the town's participation in the Vermont Home Energy Challenge hosted by Efficiency Vermont. Weybridge won this challenge. The initiative was part of an effort to achieve the state's comprehensive energy plan goal of getting 80,000 homes weatherized by 2020 and each town was challenged to weatherize three percent or more of the homes. Weybridge won the statewide award by completing weatherization projects in five percent or fifteen of the town's homes. The Committee is now using the momentum from the weatherization project success to shift its attention to diverting food scraps from the waste stream. In May 2017, WEC hosted a composting education workshop on Vermont Green-Up Day where WEC members worked with thirteen residents on composting strategies and practices. As our community partner in this project, the committee's expertise, leadership, knowledge of the community and social capital have been of significant help in conducting our research and will be essential in collaborating to produce solutions to reach compliance with Act 148.

Addison County Solid Waste Management District (ACSWMD)

The ACSWMD is a union district of 20 municipalities (including Weybridge) in Addison County. Its work centers on addressing the waste management interests and needs of its member towns by promoting waste reduction, maximizing diversion of waste through reuse, recycle and composting, and by providing for the disposal of remaining waste. The District has been identified as a key player because it manages a transfer station in Middlebury, Vermont, where residents can dispose of recyclable items and special wastes. Additionally, it conducts educational and outreach campaigns, and creates programs and incentives to promote best waste management practices. The District's workshop on backyard composting is of particular interest to our project.

Private Haulers

1. *Casella*

Thirty percent of Weybridge residents who responded to our questionnaire (at least 90 households in the town) use the curbside pickup service provided by Casella Waste Systems, Inc., a trash hauling company that operates in six states in the Northeastern United States. Aspiring to supplement traditional waste management services with its expertise in resource renewal and sustainability, Casella has been practicing zero-sort recycling since 1977. Recently, Casella started offering a curbside organics pilot collection in the city of Burlington, Vermont, at a price of $9.87 per month for bi-weekly pickup and $19.87 for weekly pickup, in addition to what the customers already pay for trash and recycling (Cassella Customer Service representative, personal communication, October 30 and November 7, 2017). Casella provides free six-gallon containers to pilot program participants. The company aims to expand this service to other cities and towns in Vermont to meet the goal of diverting all food waste from landfill by 2020.

2. *No Waste Compost*

According to Michele Morris, the Director of Outreach and Communications at the Chittenden Solid Waste District, a new curbside service provider, No Waste Compost, is providing similar service. No Waste Compost charges a monthly price of $10 for weekly compost pickup, $8 for bi weekly, and $5 for monthly (M. Morris, email correspondence, November 3, 2017). They also offer a free 5-gallon bucket to all members who subscribe for this service. While No Waste Compost does not serve Weybridge, this is an example of how other Vermont haulers similar to Casella are preparing for Act 148.

3. *Brenda Kimball*

Brenda Kimball is one of Weybridge's private sector trash haulers. She brings her truck every Saturday morning to Weybridge's recycling center next to the volunteer fire department. Recently, she has started accepting compost bags in addition to trash but is struggling with how to price her additional collection. Residents drop-off bags of trash and pay $4 per 30 gallon bag. For compostables she charges $4 for a five gallon pail and for half that she will charge $2. Right now, she only has one person engaging in compost drop off, and most weeks she does not receive any. Brenda's service of trash collection offers a community driven alternative to the larger Casella. Her service is popular for two reasons: it is extremely affordable for residents compared to Casella's rates, and it centers around Weybridge's commitment to supporting local business and a member of the community. Additionally, she often has customers who bring her small bags of bones or other materials they do not want in their backyard system. In her opinion, backyard composting is the choice system for Weybridge residents, and because of that success, she probably will never have a large composting business. Brenda hands out fliers and advises her clients on proper waste disposal - she is a key resource in educating the town during the transition to zero food waste. Once her truck is full, she drops the trash off at ACSWMD and, like the Waste Management District, drops the compost off at Vermont Natural Ag Products (B. Kimball, personal communication, October 14 and November 21, 2017).

4. *Weybridge Elementary School*

On October 17, we visited the Weybridge Elementary School to interview Principal Christina Johnston and Megan Sutton, the point person for revisiting the school's composting practice. In the 1980s, Weybridge Elementary had a successful zero food waste program, where the children were only allowed to throw away one ounce of food per meal. It was suspended because the school faculty and parents thought this "adult-driven waste watch process" imposed too much "mental stress" on the children. Moreover, a federal law is now in place that requires the school to serve certain food to the kids, whether they will eat it or not, thus makes achieving zero food waste especially hard for the school.

According to Ms. Sutton, the school generates at least three to four gallons of food waste per day, including both waste from the kitchen prep and uneaten food waste. The former cook at the school brought food waste home to feed her chickens. Ms. Sutton hopes the school can establish a new composting system that can be incorporated into the curriculum and engage the children.

Principal Johnston and Ms. Sutton described their current situation and obstacles. Most importantly, they are unsure of what the best composting practice is. They ran into vermin, bear, and rat issues. No one managed the compost system during summer when school is not in session. For these reasons, they are interested in learning more about and experimenting with "The Gold Standard" set by Ferrisburgh Central, an elementary school 12 miles north of Weybridge in Ferrisburgh, Vermont, or any other creative solutions that we might come up with, such as feeding local livestock (C. Johnston and M. Sutton, personal communication, October 17, 2017).

II. Survey Results

To understand Weybridge residents' current composting habits we surveyed the town. The questionnaire posed ten questions pertaining to how residents dispose of their trash, lawn waste and food waste. The participation was voluntary, and for that reason, there is a factor of self-selection. We posted the survey on Front Porch Forum, a community message board, and handed it out at Brenda's Saturday morning trash drop-off. Although Front Porch Forum is used by residents of both Weybridge and Cornwall, a neighboring town, we controlled our responses to Weybridge residents by including with our first question, "Are you a resident of Weybridge?" that did not allow those who responded no to continue with the survey. Residents from 46 of Weybridge's 300 households, nearly 15% of all households, responded to the survey. Respondents ages ranged from 18 to older than 85.

The results of the survey suggest that the majority of respondents already backyard compost, but they are not necessarily composting all of their food waste. Figure 1 shows that 85.3% of respondents backyard compost, 8.8% drop their compost at a designated compost facility, 2.9% drop compost off with a hauler and 2.9% put it in the trash. These results are concurrent with a 2013 survey the ACSWMD distributed. They found that 88% of Weybridge residents who responded to the survey composted at home (ACSWMD 2013). Despite these promising numbers, only 72% of respondents compost 75% or more of their compost. Additionally, only 7.5% of the respondents have gone to the ACSWMD free workshops on backyard composting methods.

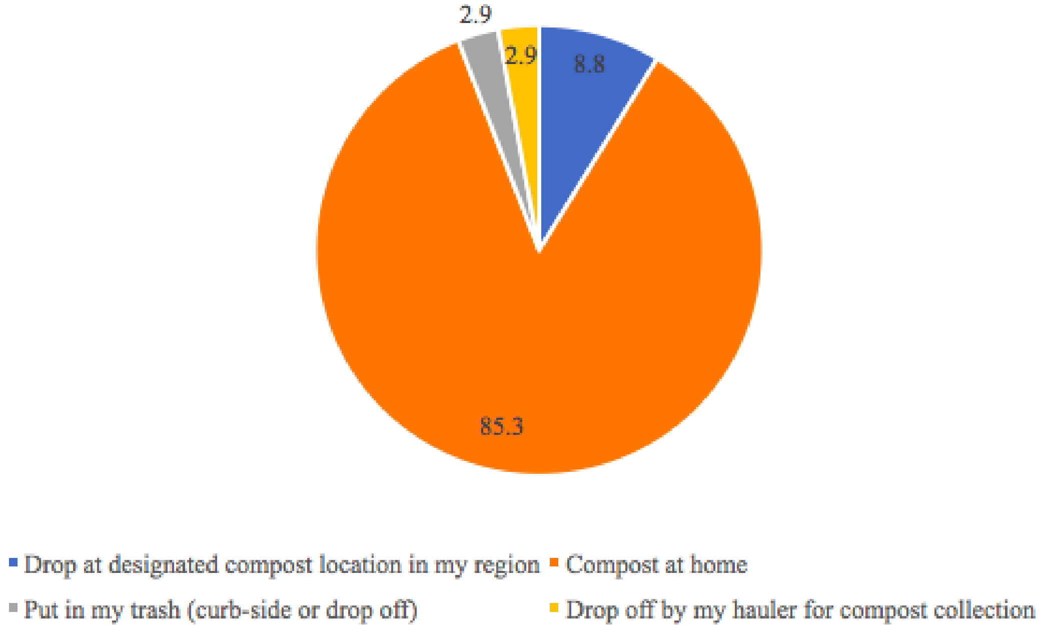


Figure 1: The distribution of how the survey sample disposes of their food waste.

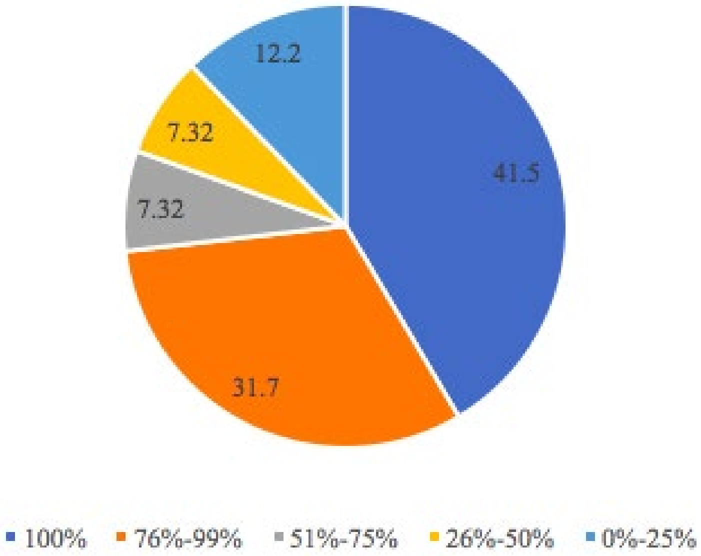


Figure 2: The distribution of what percent of their food waste the survey sample put in the compost.

In 2014, National Waste and Recycling Association found that 28% of Americans compost (National Waste and Recycling Association 2014). Weybridge residents' compost rate is significantly higher than the rest of the U.S. Much of the community has an established compost routine. The gaps in composting practices are the approximately ten percent of households that responded to the survey that are not composting, households that are composting only a portion of their food waste, and the majority of residents who are not taking advantage of the available compost education opportunities.

The survey was only available to residents who use Front Porch Forum and came to the Saturday morning trash pick-up on October 14th. About 15% of Weybridge households responded to the survey. We recognize they may not perfectly represent the community. However, both our survey sample and the population of Weybridge have an average household size of 2.5 people. The survey gives us direction on the steps to recommend to the WEC in order to fulfill the goal of no food waste in landfills by 2020.

III. Case Studies

Hamilton and Wenham Massachusetts Curbside Composting Case Study

Given that Casella and other trash hauling services around Vermont must comply with Act 148 by 2020, we have examined a rural and small town organics management case study in Massachusetts. Although the two towns of Hamilton and Wenham have larger populations than Weybridge, we hope that the case study will act as an example of a successful incorporation of a composting service into an pre-existing curbside operation.

Similar to Weybridge, the incorporation of composting food scraps and yard trimmings was spurred by a state law centered around diverting recyclables. This law demanded all cities and towns must ensure the separation of all banned materials (leave and yard waste, recyclable cardboard and paper, and commercial organic materials among others) from the waste stream. Private haulers and municipalities collecting waste were also required to meet regulation by submitting compliance plans to the Massachusetts Department of Environmental Protection (DEP) (Mass.gov). Due to the success achieved regarding diversion of recyclables, the Hamilton Recycling Committee turned their attention to organics composting. The incorporation centered around a two-stage pilot. Beginning in 2009, the first stage of the curbside composting pilot involved 74 Hamilton households and ran for eight weeks. During this stage, the costs of both hauling and processing the organics were waived by New England Solid Waste and Brick Ends Farm respectively, which made the pilot free to participants. The second stage involved 600 households in Hamilton and Wenham. Participants paid $75 for a one year, once a week collection in addition to the initial investment of $29 for a curbside cart and kitchen bucket. Ultimately, the pilot program successfully diverted almost a third of household waste, and it received support and enthusiasm to continue the program from the residents. After only nine months of the implementation of a town-wide program at no additional cost, Hamilton saw a trash reduction of 30%.

Much of the success of the program came from making organic diversion attractive from a cost perspective. In the second stage of the pilot, a $7,000 grant from the DEP and private donations covered the $29 cost of the collection carts and kitchen bins for the first 500 out of 600 participants. The hauling service, Hiltz, changed to split body trucks that collected both recyclables and organics every week. A second, normal truck, collected trash every other week. This replaced the previous system of weekly trash and bi-weekly recycling trucks. This shift in schedule allowed Hiltz to add organic collection at a minimal increase to hauling costs. Finally, Hiltz only paid a tipping fee of $40 per ton for organics compared to one of $70 for trash – this allowed Hiltz to cut disposal costs by 15% to 25%, providing a large financial incentive that supported the incorporation of food waste separation.

While all these changes were important from the business perspective of the hauler, it would not have been possible without the hard work of the Hamilton Recycling Committee (HRC), leaders from the community and the grands from the DEP. The HRC and other residents worked to promote the and sign up participants for the pilot. Neighborhood Captains distributed letters, brochures and engaged in presentations. A “Trash Hot Line” was set up to address resident concerns and remove the “yuck” factor associated with composting. Informational booklets were handed out with the new trash and food waste carts. Here, education and outreach strategies were vital.

There are a few key lessons to take from the success of the Hamilton and Wenham programs. First, the importance of the pilot program to assure a smooth incorporation of organic hauling. This pilot program allowed the trash hauler, processor and a small portion of residents to test out the new system in two different rounds. Casella, one of the haulers in charge of

Weybridge, is currently testing out its own pilot program in Burlington, as we have addressed earlier in our report. Second, we see the importance of grants that funded 500 collection containers and the information booklet that was distributed with them. Finally, the involvement of the HRC and dedicated residents were essential – a role we see as well in the WEC. These committees act as resources to help the communities ease into a zero food waste system (Northeast Recycling Council, Inc., Hamilton and Wenham).

Central Vermont Solid Waste Management District Organics Management Case Study

While the Massachusetts case study helped address our focus on the incorporation of organics into curbside hauling, a second case study about the Central Vermont Solid Waste Management District (CVSWMD) focusses on backyard composting, Drop-off composting, and how to achieve composting in regional schools. Additionally, this case study is of interest because it focusses on the CVSWMD, while our work pertains to another, the ACSWMD. We hope we can draw from the success of another Solid Waste Management District in Vermont and apply it to our own.

Backyard composting was addressed through the Residential Organics Diversion Program, which helps residents manage food scraps at home instead of relying on another service to dispose of food waste. The program provides three types of backyard composting infrastructure: the Soilsaver Classic Composter bin, the Green Cone in-ground food scrap digester, and plans to "build-your-own" compost bins. The Soilsaver is a $50 bin that makes compost harvesting easy with two sliding access doors, an opening on top large enough to fill and mix easily, a locking lid that keeps vermin out, and watering holes that keep compost moist and healthy. A second option that requires less maintenance and work but is offered for a more expensive initial cost is the Green Cone offered for $125. This cone is placed in a hole that is 32 inches wide and 26 inches deep in a spot that receives a decent amount of sun. It breaks down all food scraps, including meat, fish, dairy, and bones. Because it is buried in the ground, the nutrients seep out into the surrounding soil – while it does not generate compost a homeowner can harvest, it does benefit the surrounding soil or garden. The decomposition speeds up in warm, sunny months, but the process is successful year-round because much of the material is underground and heat is trapped in the cone. Lastly, the CVSWMD has five options for "do it yourself" compost bins that a homeowner can build in his or her backyard.

The case study also provides insight into the district wide school organics program called School Zero Waste Program. The CVSWMD provided collection buckets, educational signage and technical assistance for no cost to the 25 in-district schools through its School Zero Waste Grants program - schools may apply annually for grants up to $2,500 for projects that help public schools in Central Vermont actively reduce waste (CVSWMD, School Zero Waste Grant). The school's' success came from student "compost monitors" who direct the disposal of waste during lunch. The CVSWMD hired eleven high school students in 2011 to staff part-time compost monitor jobs at three schools, providing a financial incentive that recruited students as eager compost managers. The food waste generated was transported off site to various composting facilities in the Central Vermont region.

Similar to the Massachusetts case study, education and outreach acted as the foundation of community support and buy in. The path to school participation began with a waste stream audit conducted by the CVSWMD in order to determine the most achievable ways for a school to reduce its waste. Again, the access to grants were key for both school and backyard success. The schools received grants through the School Zero Waste Grant Program. Additionally, the Green Cone Pilot program received funding from a USDA Rural Development Grant and helped fund two Green Cones and a compost bin for the 90 households participating in the study. Although there is a higher upfront cost, backyard composting does not need to be a complex project and can still be done productively without investing large amounts of time and effort. While the ACSWMD sells Green Cones at a discounted price of $125 to Addison County residents, there are tradeoffs: it does not need to be constantly tended to and does not require the mixture of leaves with food waste, but Addison County's soil composition (mostly clay) makes it particularly tough to install the Green Cones and achieve the soil benefits (Northeast Recycling Council, Inc., ACSWMD).

Ferrisburgh Central – "The Gold Standard"

When talking with Fran Putnam, our community partner and WEC member, she mentioned that Weybridge Elementary could use strategies from Ferrisburgh Central, "The Gold Standard" of school composting systems. In order to get a better understanding of Ferrisburgh's success, we visited Ferrisburgh and spoke to Principal Beth Brodie and Science Teacher Judy Elson on October 18th, 2017.

The food sorting process occurs daily at the end of each lunch period and is led by the student composting crew. Starting from the second grade, students are capable of sorting. An adult supervisor does the final check to ensure the waste has been sorted correctly. When the food waste bucket is filled, which usually occurs once or twice a week, the crew brings the bucket out to the composting shed by the school garden. In addition to food scraps from lunch, students bring out compost bins that are located in every classroom. The composting shed has three bins that are lined with hardware cloth to keep vermin out (see Appendix for pictures. There is a nine-month compost rotation process that incorporates manure and turning compost from one bin to the next. The school received funding to build the shed through a grant for the supplies, but the manual labor of building the structure was executed by local residents (Brodie and Elson Interviews).

For Principal Brodie, there are two keys to Ferrisburgh's success:

1. Excitement from the students – There is no shortage of enthusiasm from the students, which can be attributed to the incorporation of composting into the curriculum. Students learn the importance of composting in Kindergarten when they are assigned a crop in the garden that they watch grow over their time at the elementary school. Through this, students see how productive their garden can be with the compost and eat food from the garden from the cafeteria. As the students get older, recycling also becomes an important part of their education: fifth and sixth graders take a fieldtrip to a Burlington recycling facility. Ms. Elson says that the most important element is that the "school has slowly over time brought [composting] into the program and it has become part of the culture."
2. Dedicated personnel – Principal Brodie attributes much of the success of Ferrisburgh's composting system to Judy Elson. While Ms. Elson spearheads the system, community buy-in is essential: families sign up for weeks in the summer to ensure the process continues when school is out of session so that Ms. Elson does not have to be responsible year-round.

This "gold standard" system was not built overnight. The process began with food audits that allowed for data collection on food waste patterns. The first phase began with large black roller bins that were only for veggies in the fall and spring. The system has evolved into composting everything, all year-round. Using the compost system as a fundamental aspect to the students' education, both in the classroom and in all school assemblies, has proven successful in creating an atmosphere that takes food waste diversion seriously. Thanks to this system, Ferrisburgh has been able to divert 80-100 lbs of food waste per week from the landfills and generate healthy, productive compost that can be used in the school's garden (B. Brodie, personal communication October 18, 2017; J. Elson, personal communication, October 29, 2017).

Island Design Assembly - Compost Commons for North Haven Community School (ME)

Island Design Assembly (IDA) is a one-week design program that brings together a team of students, architects and community members to build and install a project in an island community in Maine's Penobscot Bay. It is run by Middlebury-based McLeod Kredell Architects, owned by Architects Steve Kredell and John McLeod, a Middlebury College professor. The 2015 IDA project took place on North Haven Island and resulted in the design and build of three compost bin towers at the North Haven Community school, the smallest school in the state of Maine.

This particular case study is of interest to our work because many of its components could be replicated in Weybridge. The design features three triangular bin towers protected from the snow with a capacity to hold approximately 80 cu. ft of compost. They have loading and unloading panels to add and subtract material easily. Smooth chalkboard slats on the middle sections and a variety of modular seating pieces allow the bins to act as an outdoor educational space, fostering the curricular connections through the process of composting. The innovative design also works to create an aesthetically pleasing structure that can be used as a gathering space for special occasions, and it allows for decorative lamps to be temporarily hung in the towers. Additionally, its strategic placement next to the school's garden and greenhouse provide the opportunity for students to see the food cycle in a tangible way, thus enabling them to understand the benefits of composting.

This project could serve as a model for Weybridge Elementary School to create a practical and educational compost station as part of their annual engineering design project, making the necessary adjustments for the particular site and environmental context of Weybridge. With a disclosed construction cost of only $2,250, we think that this model could serve as inspiration for a community compost station used for educational purposes as well as a practical option for community members who might not be able to create their own backyard compost.

IV. Cost and Benefit of Food Waste Disposal Options

Although it is hard to obtain the exact cost structure of trash hauling companies such as Casella, we anticipate their cost of adding a compost line would include: (1) purchasing new trucks or redesigning their current trucks for organics pickup and dropoff, (2) cost of mileage and new drivers to serve on extra trips or route changes, (3) tipping costs of food waste disposal, and (4) additional management cost. Casella would pass on the costs for this business expansion to the customers who sign up for the service and possibly to customers that do not depending on the cost impacts of this expanded business infrastructure.

Weybridge residents also have the option of backyard composting. This practice would incur a one-time monetary cost of compost bins. Afterwards, the opportunity cost of regular maintenance should be taken into consideration. To obtain more information on people's behavior, we interviewed Grant Berman, a Middlebury student and the founder of Dirty Boys Composting, a company that has installed and maintained more than 250 backyard compost piles in eastern Massachusetts (Dirty Boys Composting). Grant told us people's most common concern is whether or not composting will attract animals to their backyards. Besides that, most people are hesitant to start backyard composting because they don't know where to begin. Once they decide to take action, however, backyard composting bins do not require much maintenance. Grant recommends his customers tend to their bins about once a week to balance the carbon-nitrogen ratio, check the moisture, add in fresh material, etc. Overall, his customers spend about 20 to 40 minutes outside tending to their bins every week.

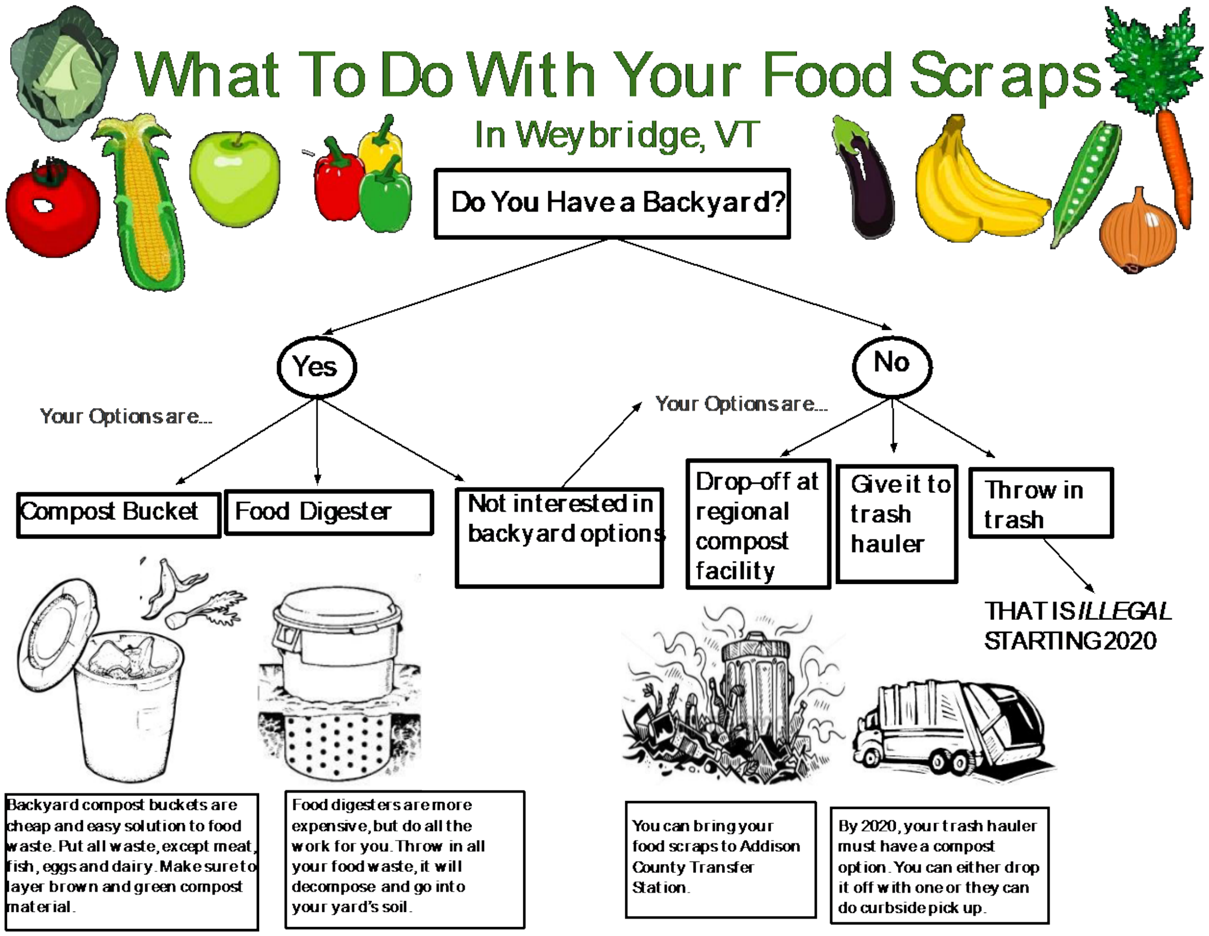
In addition, Grant said that although curbside composting companies such as Bootstrap find success in Boston, backyard composting is more popular in the areas outside of the city where people have more space to put a composting bin (G. Berman, personal communication, November 8, 2017). Therefore, backyard composting should be the more plausible food waste disposal option for Weybridge.

V. Campaign Plan

An important component of engaging the community is outreach. There are many ways to connect with any community. From case studies and outside research we focused on a handful of educational material that we intend to be effective in Weybridge. Below are strategic recommendations specific to Weybridge:

1. Printed Information Materials

We have created a sample flyer that can be distributed in Weybridge. Brenda at her drop off, WEC on their Facebook page, Weybridge elementary and other community organizations can hand out fliers like this one to inform the community about composting options. Act 148 is a soft law, so community outreach and education is key to inform and motivate the community to



What To Do With Your Food Scraps

In Weybridge, VT

Do You Have a Backyard?

Yes

Your Options are...

- Compost Bucket
- Food Digester
- Not interested in backyard options

No

Your Options are...

- Drop-off at regional compost facility
- Give it to trash hauler
- Throw in trash

THAT IS *ILLEGAL* STARTING 2020

Backyard compost buckets are cheap and easy solution to food waste. Put all waste, except meat, fish, eggs and dairy. Make sure to layer brown and green compost material.

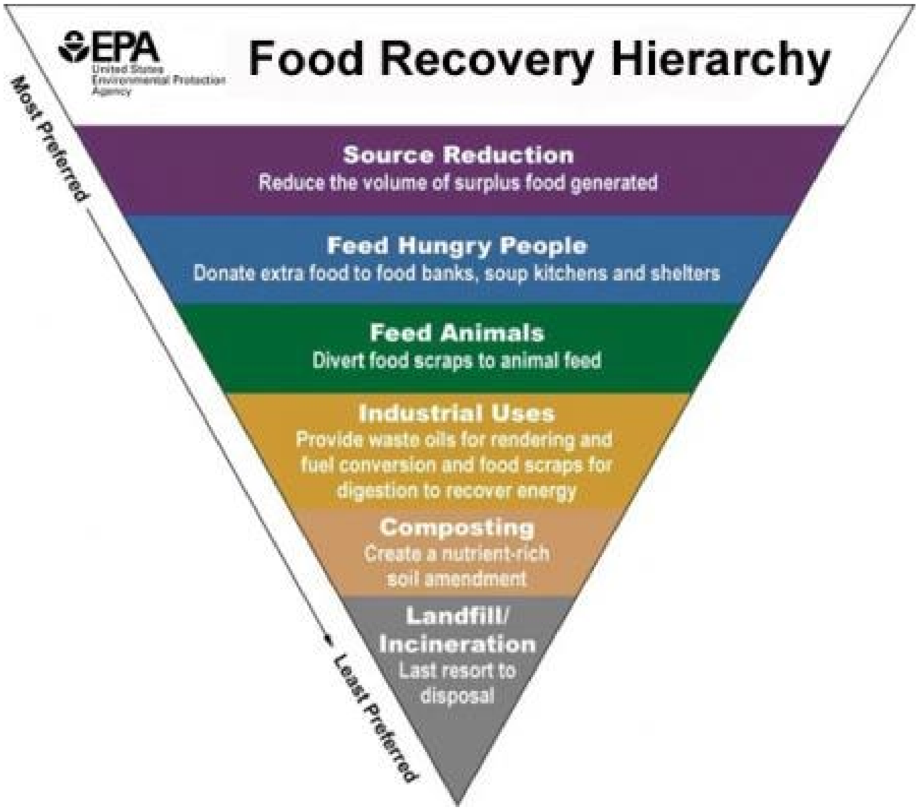
Food digesters are more expensive, but do all the work for you. Throw in all your food waste, it will decompose and go into your yard's soil.

You can bring your food scraps to Addison County Transfer Station.

By 2020, your trash hauler must have a compost option. You can either drop it off with one or they can do curbside pick up.

make changes to their food disposal methods. Simple and straightforward educational material that can reach a broad audience is key.

Pre-made graphics also provide the community with informative material about food waste. The EPA created the below graphic for the food recovery hierarchy. We have heard from a handful of Weybridge community members that this is a helpful graphic to understand the different ways to prevent and divert food waste.


EPA United States Environmental Protection Agency
Food Recovery Hierarchy
Most Preferred
Source Reduction
Reduce the volume of surplus food generated
Feed Hungry People
Donate extra food to food banks, soup kitchens and shelters
Feed Animals
Divert food scraps to animal feed
Industrial Uses
Provide waste oils for rendering and fuel conversion and food scraps for digestion to recover energy
Composting
Create a nutrient-rich soil amendment
Landfill/ Incineration
Last resort to disposal
Least Preferred

2. Free Media Information Campaigns

A second option of community outreach is to create a strategic information campaign that includes instructional and motivating information about food waste recovery that can be in the town newsletter, the local newspaper, and/or posted on Front Porch Forum. Below is a sample that explains the Act 148 and reasons behind it, as well as the composting options for Weybridge residents.

"Act 148 provides Vermonters with new systems of waste disposal, so that all recyclables and food waste is kept out of the landfills. This law requires all Vermonters to compost all their food scraps by 2020 for a number of reasons: the amount of waste going to landfills in Vermont is increasing and their capacities are decreasing, markets for compostables have increased, and research proves food waste in landfill contributes to greenhouse gases. There is a number of easy and affordable compost options for Vermonters:

a. Backyard compost: you can buy a compost bin and kitchen bucket at your local waste transfer station ($40). With the proper technique and alternating green and brown material, you can successfully turn your food waste into healthy soil for your yard or garden.

b. Food Digester: an easy solution, a food digester does all the work for you for $125 at the Waste Management District. All you need to do is install it in a sunny part of your yard, and it will digest all your food waste into water and carbon dioxide that goes straight into the soil.

c. Dropping it off at a compost facility or trash hauler: by 2020 your local transfer station and trash hauler is required to accept food scraps. The scraps are then brought to a regional compost facility. The soil that results is available for purchase.

If you have more questions about which options works best for you or if you would like to take a backyard composting workshop to learn the best methods for your household, contact Addison County Waste Management District."

3. Workshops and Presentations

We also found that workshops and presentations are a good way to engage the community on this issue. All the key players that we have worked with are knowledgeable and can provide education on how to properly compost. Since Weybridge is such a small community, we believe these people can really make a difference through ACWMD-organized backyard composting workshops, talks at community gatherings, school-sponsored events and by generally spreading the word neighbor to neighbor.

Specific Opportunities for exploration by the Weybridge Elementary School

Educational Elements

As we discussed, incorporation into the curriculum is essential to the successful implementation of a composting system at an elementary school. Ferrisburgh has done so through field trips and assigning each grade a garden crop they follow through their time at the elementary school. Below are books that may be useful to have in the Weybridge Elementary School library and classroom settings and a movie that could be shown when introducing a new system.

- Books: *Magic School Bus Meets the Rot Squad: A Book about Decomposition* (Age 4-8) *Compost Stew: An A to Z Recipe for the Earth* (Age 3-7)*, Composting: Nature's Recyclers (Amazing Science)* (Age 5-10), *Wiggling Worms at Work (Let's-Read-and-Find-Out Science 2)* (Age 4-8) (Science Books for Kids)
- Movies: *Composting for kids with Peppa Pig* (Young Children) (Compostinghome)

Monument Dairy Farms Anaerobic Digester

It was suggested we look into the anaerobic digestion at Monument Dairy Farms as a potential solution to Weybridge Elementary School's food scraps. However, after a discussion with Bob James from the farm, this is not currently a viable option. Farms must have permits to receive food waste for anaerobic digestion, and Monument Dairy Farms does not currently have the ability to accept food waste from an institution like the elementary school. They do have partnerships with companies like the Cabot Cheese Plant and Woodchuck Hard Cider, so a conversation considering a partnership between the farm and the elementary school could be beneficial. Mr. James suggested Blue Spruce Farm as another option, however, it is ten miles from Weybridge and would not be the most environmentally conscious option (B. James, personal communication, December 14, 2017).

VEEP: Vermont Energy Education Program

Per Fran's suggestion, we also looked into the Vermont Energy Education Program (VEEP) whose mission is to "build a deep understanding of energy through education, encouraging choices that result in sustainability in our communities, economy and environment."

VEEP provides in-class workshops and curricula to educate Vermonters on what energy is and how to use it efficiently (Vermont Energy Program). However, it seems that VEEP does not currently focus on composting or food waste diversion. It could be a viable option as the organization grows in the future and we recommend the WEC continue to build a relationship with them and encourage Weybridge Elementary School to do the same.

Use composting service from current hauler once becomes incorporated

If establishing onsite composting seems impractical in the short-term, the school may choose one of the food waste pickup or dropoff services as a transitional solution. The school currently uses Casella for trash collection and drops the recyclable materials at the Weybridge recycling center. To deal with their food scraps, the school could adopt one of the following options: 1) dropping off the compost at ACSWMD for free or to Brenda for a small cost, 2) having Casella pick up the compost at a cost, 3) send the compost to a digester on a nearby farm if Monument Dairy Farms would accept it.

Final Suggestion - Composting Structure by Garden

After researching a variety of options and speaking to key community members, we believe a backyard structure is the best solution for Weybridge Elementary School. Ferrisburgh Central, especially Judy Elson and Principal Beth Brodie, could serve as sounding boards during the construction and implementation of an organics composting system. In response to Weybridge's the fear of vermin, Ferrisburgh had three solutions: using large wooden bins lined with hardware cloth, using heavy lids opened by pulleys that teachers were able to open and constructing the shed far enough away from the school building so that the critters would stay near the shed. Ferrisburgh received a grant and the shed was ultimately built by members of the community. For Weybridge, while the construction could be covered by the annual engineering project, if the school did need more money than was in the program's budget, there are grants available at the ACWMD for the construction of compost facilities. Finally, further cooperation with the middle school and high school could be useful to create one universal system so that students would be able to easily continue their composting behavior as they age out of each school. Our fellow ES 401 senior seminar students worked with Middlebury Union High School to establish a streamlined sorting system, which was replicated from the middle school, if reproducing that model is of interest to the elementary school.

VI. Conclusion

The past three months witnessed the sprouting of a clearly identified path towards no food wasted. We conclude that a combination of community outreach, education, and proper incentive is a promising strategy to encourage more Weybridge residents to compost one hundred percent of their food waste in their backyards. To assist with the implementation of this strategy, we designed a flyer illustrating food scraps management options, pinpointed possible channels through which WEC can demonstrate the preferred method of onsite composting to more residents, and advised the Weybridge Elementary School with possible ways to upgrade their composting practice.

Sitting in WEC meetings and listening to committee members share their thoughts and concerns regarding this no food waste campaign, we recognize and appreciate Weybridge's voluntary effort and collective resolution in transforming useless waste to favorable energy. Based upon extensive research on Weybridge's composting behavior and adequate understanding of the town, our campaign plan caters specifically toward Weybridge -- an environmentally-minded and close-knit community with existing champion persons. We hope our small project leads Weybridge to become more eco-friendly and energy efficient. We hope this small town's effort and potential success inspire changes in other cities and towns in Vermont. We hope this small state's determination exemplified through Act 148 triggers consciousness in the rest of the country. Finally, we hope our approaches and some suggestions can be applied in places facing similar challenges.

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VIII. Appendix

Survey Questions

Hi, we are a group of Middlebury College students working with Weybridge Energy Committee. We are researching Weybridge community's waste disposal practices. Please fill out this quick survey for a chance to win a backyard compost bin and countertop food scrap collector. Fill out one per household. This survey is for a Environmental Studies senior seminar, the results will not be distributed beyond the class.

1. Are you a resident of Weybridge, VT?
   - Yes
   - No -- skip to the end of survey

2. How do dispose of your trash?
   - Trash Hauler (1)
   - Saturday Drop-off (2)
   - Other [specify]: (3) ____

3. You pay for your trash based on:
   - The size of the can you set out (1)
   - The frequency your trash is picked up (2)
   - Number of bags you dispose (3)
   - You pay the same rate no matter how much trash you produce (4)
   - Don't know (5)
   - Other [specify]: (6) ____

4. What do you do with your leaves and lawn clippings?
   - Leave on lawn or elsewhere on property (1)
   - Compost at home (2)
   - Drop at designated compost location in my region (3)
   - Drop off by my hauler for compost collection (4)
   - Removed by compost/ maintenance company (5)
   - Put in my trash (curbside or drop off) (6)
   - Don't know (7)
   - Other [specify]: (8) ____

5. What do you do with your food scraps?
   - Compost at home (1)
   - Drop at designated compost location in my region (2)
   - Drop off by my hauler for compost collection (3)
   - Removed by compost/ maintenance company (4)

- Put in my trash (curbside or drop off) (5)
- Use for animal feed (6)
- Don't know (7)
- Other [specify]: (8) ____

6. What percent of your food scraps do you compost?
   - 0%-25% (1)
   - 26%-50% (2)
   - 51%-75% (3)
   - 76%-99% (4)
   - 100% (5)

7. Describe your composting methods in one sentence:

   ____

8. Are you aware of the Addison County Waste District compost workshop?
   - Yes, I have attended one (1)
   - Yes, I have not attended one (2)
   - No, but I am interested (3)
   - No, and I am not interested (4)

9. What is your age bracket?
   - Under 18 (1)
   - 18 - 24 (2)
   - 25 - 34 (3)
   - 35 - 44 (4)
   - 45 - 54 (5)
   - 55 - 64 (6)
   - 65 - 74 (7)
   - 75 - 84 (8)
   - 85 or older (9)

10. What is the number of people in your household?
    - 1 (1)
    - 2 (2)
    - 3 (3)
    - 4 (4)
    - 5 (5)
    - 6+ (6)

11. Comments:

____

12. Please leave your email if you would be willing to answer more questions for our research:

____

13. Enter your name and email address to enter a raffle for a compost bin for the yard and a countertop food scraps bin:

____

14. Please email mjwilson@middlebury.edu if you have any further questions. Thank you!

Interviews

1. The law is coming for 2020. How are you preparing for zero food waste? How much have you already thought about it?

We think a lot about eliminating food waste at our house. We appreciate the Act 148 "inverted pyramid" and are trying to follow it by eliminating wasteful practices first and foremost, implementing better meal planning, shopping the fridge first before making grocery lists, using fruits and veggies that are past their prime in smoothies and soup stocks. We also save our meat bones and boil them with our scrap veggies when we make soup stock. Foods that absolutely must be discarded go to our chickens or into our compost bin.

2. How hard do you think it'll be for your household to make the shift to no food waste in the trash?

We do not think it will be hard at all.

3. What are your current practices (for example, what do you currently do with your recycling)? How many people are in your household - do you divide the work?

See #1 for current practices with food waste. Our recycling goes to the curb for pickup by Casella. Our yard waste (leaves, garden debris, etc.) goes into our compost bin. There are two adults and one infant in our household. My husband and I divide the work.

4. Will this change the amount of waste you are sending to Brenda, Casella or another form of trash hauler you use?

No. We will not be utilizing the curbside pickup of food waste.

5. What prevents you from backyard composting?

Nothing. That stuff is as good as gold! It keeps our garden soil happy and fertile and diverts a lot of organic material from the waste stream.

6. What are the greatest barriers you have encountered if you are backyard composting?

No barriers. Despite living in a densely wooded area on Snake Mountain, our compost pile does not attract animals. It doesn't have a foul odor, it's not laborious to maintain, and it's wonderful to be able to put it on our gardens.

7. How can the Weybridge Energy Committee help you in the transition to zero food waste? Would it be helpful to have someone to show you the “best composting practices”?

I do think that it would be great for more individuals to learn about composting. I think a lot of the barriers that exist for families who want to compost can be eliminated with a bit of education around the proper balance of green to brown/carbon to nitrogen.

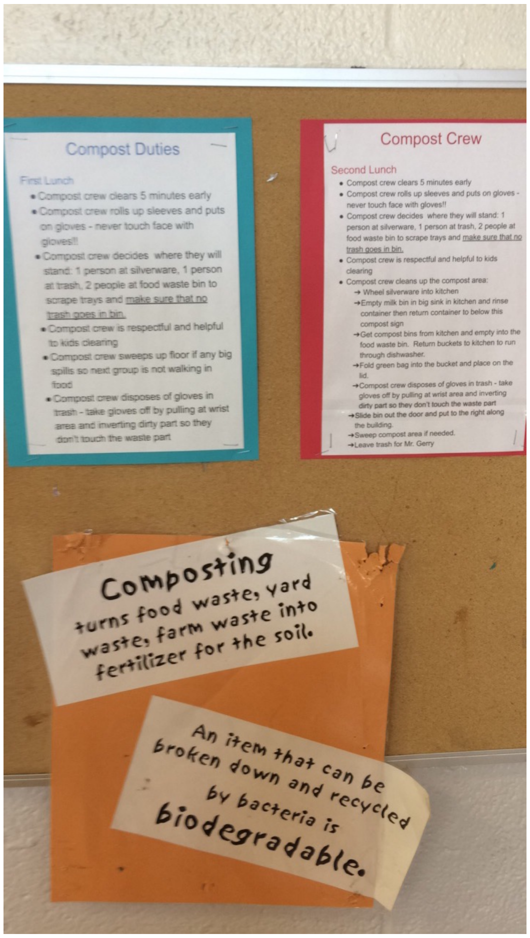
8. What would make the transition easier for you?

n/a

9. If you’re using pickup now, would you be willing to pay more for the service of compost pickup? If so how much?

I would not personally pay for compost pickup because I think there are better ways to utilize compost at home without relying on carbon expenditure for transport. That being said, I realize that some people might not have access to compost piles at home for various reasons beyond their control. I do think that there should be a fee involved in its pickup and transport. Picking it up and transporting it has labor costs and carbon costs associated. Charging for it would hopefully incentivize home composting.

Pictures from Ferrisburgh Central Elementary School



Compost Duties

First Lunch

- Compost crew clears 5 minutes early
- Compost crew rolls up sleeves and puts on gloves - never touch face with gloves!!
- Compost crew decides where they will stand: 1 person at silverware, 1 person at trash, 2 people at food waste bin to scrape trays and make sure that no trash goes in bin.
- Compost crew is respectful and helpful to kids clearing
- Compost crew sweeps up floor if any big spills so next group is not walking in food
- Compost crew disposes of gloves in trash - take gloves off by pulling at wrist area and inverting dirty part so they don't touch the waste part

Compost Crew

Second Lunch

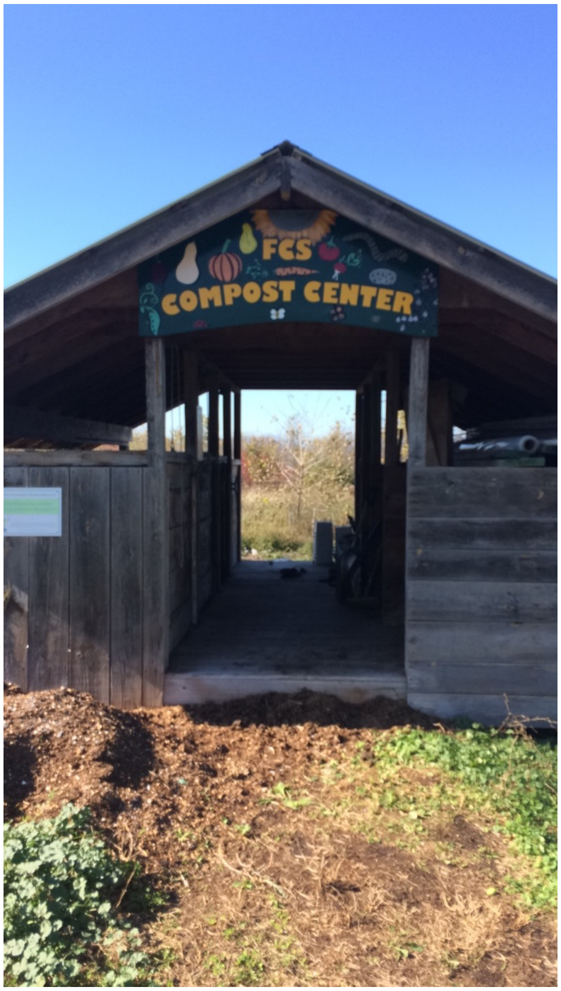
- Compost crew clears 5 minutes early
- Compost crew rolls up sleeves and puts on gloves - never touch face with gloves!!
- Compost crew decides where they will stand: 1 person at silverware, 1 person at trash, 2 people at food waste bin to scrape trays and make sure that no trash goes in bin.
- Compost crew is respectful and helpful to kids clearing
- Compost crew cleans up the compost area:
  - → Wheel silverware into kitchen
  - →Empty milk bin in big sink in kitchen and rinse container then return container to below this compost sign
  - →Get compost bins from kitchen and empty into the food waste bin. Return buckets to kitchen to run through dishwasher.
  - →Fold green bag into the bucket and place on the lid.
  - →Compost crew disposes of gloves in trash - take gloves off by pulling at wrist area and inverting dirty part so they don't touch the waste part
  - →Slide bin out the door and put to the right along the building.
  - →Sweep compost area if needed.
  - →Leave trash for Mr. Gerry

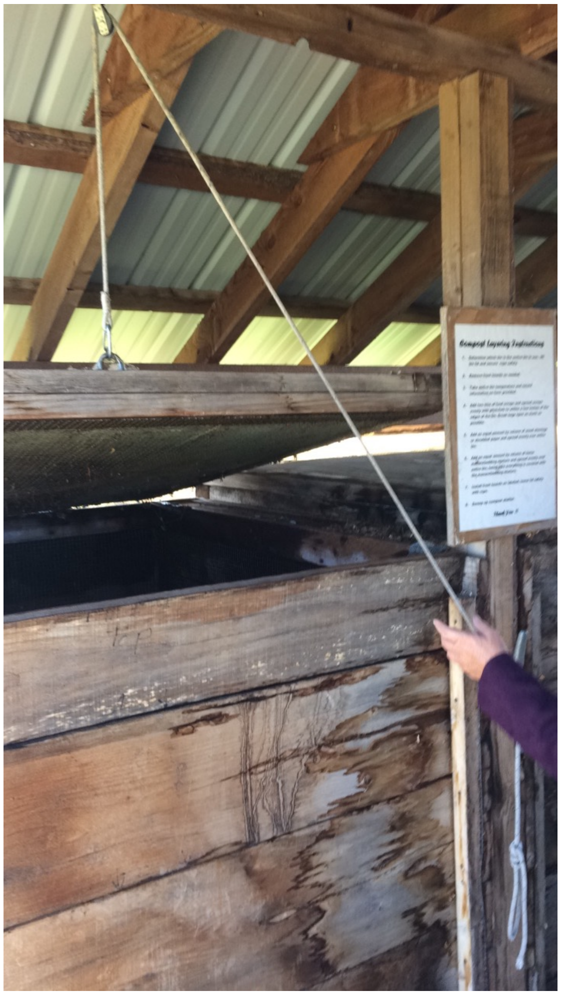
Composting turns food waste, yard waste, farm waste into fertilizer for the soil.

An item that can be broken down and recycled by bacteria is biodegradable.

Composting duties and shifts clearly displayed in cafeteria.

Sorting station with student sorters (as young as second grade) and adult monitors.





Composting shed. Garden right behind.

Heavy bins controlled by pulleys and lined with hardware cloth keep vermin out.